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			EXAMINER	
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			3714	
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

Application No.

10/617,484

Applicant(s)

MARSHALL, THOMAS D.

Examiner

Jason Pinheiro

Art Unit

3714

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 11 August 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-36 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-36 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## DETAILED ACTION

1. After the amendment filed on 08/11/2006 has been considered, claims 1-2, 26, and 36 were amended. As a result claims 1-36 are pending.

### ***Claim Rejections - 35 USC § 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-2, 5-7, 11-12, 16-17, and 21-23 are rejected under 35 U.S.C. 102(b) as being anticipated by Vigg (US 2,750,670).

Regarding claims 1: Vigg discloses a model of dental caries, comprising: an artificial tooth (*Figs. 3 and 4*), wherein the artificial tooth comprises a cavity (57), and wherein the cavity comprises: an opening that extends from an exterior surface of the artificial tooth to at least a simulated dentinoenamel junction of the artificial tooth; and wherein the opening extends along at least a portion of the simulated dentinoenamel junction (*Figs. 3 and 4; A cavity can extend from the exterior of the tooth through the enamel to the dentin, as shown.*); and simulated decay material in the cavity (*col. 5, 37-48; A cavity can be filled with simulated decay material.*).

Regarding claim 2: Vigg discloses that the opening contains simulated decay material (*col. 5, 37-48*).

Regarding claim 5: Vigg discloses that the artificial tooth comprises resin (*col. 5, 7-10; Dentin can comprise resin.*).

Regarding claim 6: Vigg discloses that the artificial tooth comprises melamine resin (*col. 5, 10-11*).

Regarding claim 7: Vigg discloses that a surface defined by the cavity is configured to bond to the simulated decay material (*col. 5, 47-52; Decay material can be removed by drilling. Decay material must be able to bond to the cavity in order to realistically be removed by drilling.*).

Regarding claim 11: Vigg discloses that the simulated decay material comprises a resin material (*col. 5, 44-48; Decay material can comprise the same material used for a pulp member, which can be thermosetting plastic (col. 4, 47-55).*).

Regarding claim 12: Vigg discloses that the simulated decay material comprises a porous substance (*col. 4, 47-55; Decay material (similar to pulp material - col. 5, 44-48) can be thermoplastic.*).

Regarding claim 16: Vigg discloses that the simulated decay material is homogeneous (*col. 4, 47-55; Decay material can be thermoplastic, as described above.*).

Regarding claim 17: Vigg discloses that the simulated decay material is curable (*col. 4, 47-55; Decay material can be rubber or thermosetting plastic, as described above.*).

Regarding claim 21: Vigg discloses that the simulated decay material is radiolucent (*col. 5, 64-68; Decay material can be substantially free of radio-opaque material.*).

Regarding claim 22: Vigg discloses that the simulated decay material is radio-opaque (*col. 5, 53-57; Decay material can be radio-opaque.*).

Regarding claim 23: Vigg discloses that the simulated decay material is of uniform hardness (*col. 4, 47-55; Decay material can be thermoplastic or rubber (as described above), which both have uniform hardness.*).

### ***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claim 36 is rejected under 35 U.S.C. 103(a) as being unpatentable over Vigg (US 2,750,670).

Vigg '670 discloses that which is discussed above. Although Vigg does not specifically disclose cutting a cavity into the artificial tooth, it would have been an obvious method of creating a cavity in an artificial tooth to one skilled in the art at the time the invention was made in order to create a more realistic cavity and therefore create a better learning aide.

6. Claims 3, 4 and 26-33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vigg (US 2,750,670) in view of Hayka et al. (US 5,688,118).

Regarding claims 3, and 28: Vigg discloses applicant's basic inventive concept of a model of dental caries, substantially as claimed, but does not expressly disclose the opening comprises one or more grooves along the simulated dentinoenamel junction. Hayka discloses the progression of caries through a tooth comprises one or more grooves along the dentinoenamel junction (*col. 1, 47-50; Figs 2a-2c show the progression of decay material including grooves along the junction between the dentin and enamel.*). It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention from the teaching of Hayka to modify the model of Vigg by simulating the progression of caries of Hayka to provide a realistic simulation.

Regarding claim 4: Vigg/Hayka teaches the opening comprises one or more grooves, as described above, and Vigg discloses that at least one of the grooves contains simulated decay material (*col. 5, 37-48*).

Regarding claim 26: Vigg discloses a model of dental caries, comprising: an artificial tooth (*Figs. 3 and 4*), wherein the artificial tooth comprises a cavity (57), and wherein the cavity comprises: an opening that extends from an exterior surface of the artificial tooth to at least a simulated dentinoenamel junction of the artificial tooth (*Figs. 3 and 4*); and simulated decay material in the cavity (*col. 5, 37-48*). Vigg/Hayka teaches one or more grooves extending from the opening, as described above.

Regarding claim 27: Vigg discloses that the opening contains simulated decay material (*col. 5, 37-48*).

Regarding claim 29: Vigg/Hayka teaches that at least one of the grooves extends along at least a portion of the simulated dentinoenamel junction, as described above, and Vigg discloses at least one of the grooves contains simulated decay material (*col. 5, 37-48*).

Regarding claim 30: Vigg discloses that the artificial tooth comprises resin (*col. 5, 7-10; Dentin can comprise resin.*).

Regarding claim 31: Vigg discloses that the simulated decay material is radiolucent (*col. 4, 56-58; Decay material can be free of radio-opaque material, as described above.*).

Regarding claim 32: Vigg discloses that the simulated decay material is radio-opaque (*col. 5, 53-57; Decay material can be radio-opaque.*).

Regarding claim 33: Vigg discloses that the simulated decay material is of uniform hardness (*col. 4, 47-55; Decay material can be thermoplastic or rubber (as described above), which both have uniform hardness.*).

7. Claims 8-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vigg (US 2,750,670) in view of Stein (US 3,846,011).

Regarding claim 8: Vigg discloses a model of dental caries. Vigg does not disclose expressly that a surface defined by the cavity is textured. Vigg teaches that it is the object of the model to accurately simulate the texture of the elements of the tooth (*col. 1, 42-45*). Examiner takes OFFICIAL NOTICE that it is well known in the art of dentistry that the insides of cavities include texturing. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the applicant's invention for a surface defined by the cavity, in the model

of Vigg, to be textured because this and other prior art models are intended to simulate such, and this feature would make the model more realistic

Regarding claims 9, and 10: Vigg discloses a model of dental caries. Vigg does not disclose expressly that a surface defined by the cavity is textured with an etching solution, and wherein the etching solution comprises an acid. Stein teaches texturing the surface of plastic using acid etching (*col. 1, 21-24*). As described above, it is obvious to texture a surface defined by the cavity. Stein teaches a method for doing so. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the applicant's invention from the teaching of Stein to modify the model of Vigg by texturing the surface defined by the cavity with an acid etching solution as taught by Stein to provide a more realistic model.

8. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Vigg (US 2,750,670) in view of Sugiura et al. (US 5,674,930).

Vigg discloses the simulated decay material comprises a porous substance (*col. 4, 47-55*). Vigg does not disclose expressly the porous substance comprises pumice. Sugiura discloses a thermoplastic resin (*col. 3, 3-7*) using inorganic fillers (*col. 12, 59*) like pumice (*col. 13, 2*). It would benefit the porous substance (such as thermoplastic) of Vigg to include inorganic filler to reduce the cost of the simulated decay material. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the applicant's invention from the teaching of Sugiura to modify the simulated decay material of Vigg by adding the pumice of Sugiura to reduce the cost.



9. Claim 14 rejected under 35 U.S.C. 103(a) as being unpatentable over Vigg (US 2,750,670) in view of Doret (US 2,256,667).

Vigg discloses a model of dental caries. Vigg does not expressly disclose that the simulated decay material comprises coloring. Doret discloses that the simulated decay material comprises coloring (*col. 3, 14-20; Parts of the artificial tooth including the various ailments (like tooth decay (34)) can be colored.*).

Doret teaches that the coloring of the parts in their natural tints is very desirable in order to thoroughly impress the patients and students and obtain their full attention (*col. 3, 14-20*). It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention from the teaching of Doret to modify the model of Vigg by including the coloring of Doret to thoroughly impress the patients and students and obtain their full attention.

10. Claims 15, and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vigg (US 2,750,670) in view of Fukunishi et al. (US 6,084,005).

Regarding claim 15: Vigg discloses a model of dental caries. Vigg does not disclose expressly that the simulated decay material comprises food coloring. However, Vigg indicates simulating color (*col. 1, 42-45*). Applicant has not disclosed that food coloring solves any stated problem or is for any particular purpose. Moreover, it appears that the model of Vigg, or applicant's invention, would perform equally well with the coloring taught by Vigg. Accordingly, it would have been prima facie obvious to one of ordinary skill in the art at the time the invention was made to have modified Vigg to use food coloring because such a

modification would have been considered a mere design consideration which fails to patentably distinguish over Vigg.

Regarding claim 20: Vigg discloses applicant's basic inventive concept of a model of dental caries, substantially as claimed, but does not expressly disclose that the simulated decay material is detectable by caries detecting stain. Fukunishi shows this feature to be old in the dental art. Fukunishi teaches that a caries detecting stain is conventional in the treatment of tooth caries (*col. 1, 16-21*). Vigg discloses that it is desirable to provide the experience of operating on an actual tooth (*col. 5, 48-52*). Since it is conventional to use a caries detecting stain when operating on teeth with caries, it would benefit the model of Vigg to have decay material that is detectable by caries detecting stain to provide a more realistic simulation. It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention from the teaching of Fukunishi to modify the model of Vigg by allowing for the use of caries detecting stain taught by Fukunishi to provide a more realistic simulation.

11. Claims 18, and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vigg (US 2,750,670) in view of Muller et al. (US 5,070,165).

Vigg discloses a model of dental caries. Vigg does not disclose expressly that the simulated decay material is curable with visible light. Muller discloses a plastic curable by visible light (*col. 17, 25-28*). It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention from the teaching of Muller to modify the model of Vigg by using the plastic curable by visible light taught by Muller to provide a plastic that is easy to cure.

12. Claims 24-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vigg (US 2,750,670) in view of Turdiu et al. (US 6,164,966).

Vigg discloses a model of dental caries. Vigg does not disclose expressly that an outer layer of simulated decay material is softer than an inner layer of simulated decay material (and thus the inner layer has a greater hardness than the outer layer, as in claim 25). Turdiu discloses that in an actual caries-infected tooth an outer layer of decay material (*demineralization zone 33 (col. 4, 55-56)*) can be softer than an inner layer of decay material (*transparent dentin 35 (col. 4, 56), also known as sclerotic dentin*). It would benefit the model of Vigg to use the teachings of Turdiu as a basis for simulating decay material because Turdiu teaches how decay material is in a real tooth. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the applicant's invention from the teaching of Turdiu to modify the model of Vigg by using the decay material layers taught by Turdiu to more accurately simulate real decay material.

13. Claims 34-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vigg (US 2,750,670) over Hayka et al. (US 5,688,118) as applied to claim 26 above, and further in view of Turdiu et al. (US 6,164,966).

Vigg/Hayka discloses a model of dental caries. Vigg/Hayka does not disclose expressly that an outer layer of simulated decay material is softer than an inner layer of simulated decay material (and thus the inner layer has a greater hardness than the outer layer, as in claim 35). Turdiu discloses that in an actual caries-infected tooth an outer layer of decay material (*demineralization zone 33 (col. 4, 55-56)*) can be softer than an inner layer of decay material (*transparent*

*dentin 35 (col. 4, 56), also known as sclerotic dentin*). It would benefit the model of Vigg/Hayka to use the teachings of Turdiu as a basis for simulating decay material because Turdiu teaches how decay material is in a real tooth.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the applicant's invention from the teaching of Turdiu to modify the model of Vigg/Hayka by using the decay material layers taught by Turdiu to more accurately simulate real decay material.

### ***Response to Arguments***

14. Applicant's arguments, see page 7, section B, filed 08/11/2006, with respect to claim 2 have been fully considered and are persuasive. The objection of claim 2 has been withdrawn.

15. Applicant's arguments, see page 7, section C, filed 08/11/2006, with respect to claim 20 have been fully considered and are persuasive. The 35 USC 112 rejection of claim 20 has been withdrawn.

16. Applicant's arguments filed 08/11/2006 have been fully considered but they are not persuasive.

Regarding independent claim 1: applicant argues that Vigg does not teach the limitation "simulated decay material in a portion of the cavity" (Page 8, Section D). Vigg does teach filling the cavity with simulated decay material (Col. 5, Lines 23-44), which would also involve filling *a portion of the cavity*. Therefore, given its broadest interpretation, Vigg's teachings would encompass the

applicants teaching of the limitation of "simulated decay material in a portion of the cavity".

Regarding claims 3-4, and 26-33: In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

Regarding claim 8: applicant argues that Vigg, in combination with the examiner's OFFICIAL NOTICE, fail to teach or suggest the limitation "wherein a surface defined by the cavity is textured" (Page 13, Section F). The applicant also argues as to the meaning of the word "texture" as utilized in Vigg's disclosure. Unless explicitly stated words are to be given their ordinary and customary meaning, and Vigg does not disclose an alternative meaning to his term "texture", and it is apparent from Vigg's disclosure that "texture" is meant to describe "the visual and tactile qualities of a surface". The examiner's OFFICIAL NOTICE states that it is well known in the art that cavities in real human teeth are textured; therefore since Vigg's disclosed artificial tooth includes the textures of an actual tooth (Col. 1, Lines 42-45), it would be obvious that Vigg's artificial tooth would include the texturing in the cavities as well.

Regarding claims 9, and 10: in response to applicant's argument that Stein (US 3846011) is nonanalogous art, it has been held that a prior art reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the applicant was concerned, in order to be relied upon as a basis for rejection of the claimed invention. See *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). In this case, the applicant's particular problem to be addressed is the etching of a surface using a solution/acid; the pertinent problem is addressed in Stein and therefore can be considered to be analogous art

Regarding claim 13: in response to applicant's argument that Suguira (US 5674930) is nonanalogous art, it has been held that a prior art reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the applicant was concerned, in order to be relied upon as a basis for rejection of the claimed invention. See *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). In this case, the applicant's particular problem to be addressed is the need for a porous substance comprising pumice; the pertinent problem is addressed in Suguira and therefore can be considered to be analogous art.

Regarding claims 24, 25, 34, and 35: In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at

the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper.

See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

17. Applicant's arguments with respect to claim 36 have been considered but are moot in view of the new ground(s) of rejection.

18. For these reasons, rejections are maintained for independent claim 1 and claims 2-25 which depend on claim 1. Rejections are maintained for independent claim 26 and claims 27-35 which depend on claim 26. Rejections are maintained for independent claim 36.

### ***Conclusion***

19. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jason Pinheiro whose telephone number is 571-270-1350. The examiner can normally be reached on M - F 8:00 AM - 4 PM;.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Pezzuto can be reached on (571) 272-6996. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JP  
04/17/2006

  
**KIM NGUYEN**  
**PRIMARY EXAMINER**